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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/816,912	03/23/2001	Ramesh M. Kakwani	4644A	6333

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EXAMINER

TRAN, BINH Q

ART UNIT

PAPER NUMBER

3748

DATE MAILED: 03/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/816,912

Applicant(s)

KAKWANI ET AL.

Examiner

BINH Q. TRAN

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-15 is/are allowed.
- 6) ☒ Claim(s) 1-6 and 16-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

The disclosure is objected to because of the following informalities:

- On page 2, line 24, the phraseology “52 EC” is unclear.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

***Claims 1-6 and 16-20 are rejected under 35 U.S.C. 102 (b) as being anticipated by Peter-Hoblyn et al. (Peter-Hoblyn) (Patent Number 5,809,774).***

Regarding claim 1, Peter-Hoblyn'774 discloses an exhaust aftertreatment system (Figs. 1-3) for use in a diesel engine (10) comprising:

a) a catalyzed soot filter (e.g. 50) downstream of the diesel engine (10) and through which the exhaust gases from the diesel engine pass, said catalyzed soot filter (50) in direct fluid communication with the position at which said diesel engine discharges said exhaust gas without any intervening catalyst therebetween;

b) an SCR catalyst (60) downstream of and in direct fluid communication with the catalyzed soot filter and through which the exhaust gases from the diesel engine pass after passing through the catalyzed soot filter; and,

c) a metering valve (e.g. 25, 32) for metering a reducing agent tending to reduce NO<sub>x</sub> at elevated temperature in the exhaust gases when passing through the SCR catalyst (e.g. See col. 7, lines 25-67; col. 8, lines 1-67; col. 9, lines 1-25).

Regarding claim 2, Peter-Hoblyn'774 further discloses that the reducing agent is ammonia and the metering valves meters the ammonia at a position between the catalyzed soot filter and the SCR catalyst (e.g. See col. 6, lines 62-67; col. 7, lines 1-25).

Regarding claim 3, Peter-Hoblyn'774 further discloses a mixing station (e.g. 29, 50) upstream of the metering valve for producing ammonia in gas or liquid form from an ammonia precursor such as urea (See col. 9, lines 7-67; col. 10, lines 1-26).

Regarding claim 4, Peter-Hoblyn'774 further discloses that the SCR catalyst is a lean NOx catalyst of a high or low temperature type and the reducing agent is a hydrocarbon (See col. 9, lines 7-67; col. 10, lines 1-26).

Regarding claim 5, Peter-Hoblyn'774 further discloses that the metering valve is positioned upstream of the catalyzed soot filter (e.g. See col. 7, lines 25-67; col. 8, lines 1-67; col. 9, lines 1-25).

Regarding claim 6, Peter-Hoblyn'774 further discloses that the catalyzed soot filter and lean NOx catalyst is formed as single brick, the brick having an upstream catalyzed portion acting as a soot filter and a downstream catalyzed portion acting as a lean NOx catalyst (e.g. See col. 7, lines 25-67; col. 8, lines 1-67; col. 9, lines 1-25).

Regarding claim 16, Peter-Hoblyn'774 discloses a method for reducing NOx emissions produced by vehicles powered by light duty diesel and similar engines having exhaust gas operating temperatures as low as about 200 EC comprising the steps of: a) increasing the NO<sub>2</sub> concentration present in the NOx gases initially generated by said engine by immediately passing the NOx exhaust gases thorough a catalyst soot filter and without passing said gases through any catalyzing device prior to entering said soot filter; b) metering an ammonia reductant into said exhaust gases after said exhaust gases have exited said catalyzed soot filter; and, c) directly passing said exhaust gases with said reductant through an SCR catalyst for reducing said NOx (e.g. See col. 7, lines 25-67; col. 8, lines 1-67; col. 9, lines 1-25).

Regarding claim 17, Peter-Hoblyn'774 further discloses that the soot filter has a catalyzed surface containing at least 25 g/ft<sup>3</sup> of a platinum metal group (See col. 5, lines 45-62).

Regarding claim 18, Peter-Hoblyn'774 further discloses that the SCR catalyst has a catalyst composition of zeolite, a promoter selected from the group consisting of iron and copper and a refractory binder (e.g. See cols. 12-14, lines 1-67).

Regarding claim 19, Peter-Hoblyn'774 further discloses that the nitrogen reductant is ammonia and said quantity of said reductant metered to said exhaust gases does not exceed a normalized stoichiometric ratio of 1.5 (See col. 9, lines 7-67; col. 10, lines 1-26).

Regarding claim 20, Peter-Hoblyn'774 further discloses that the exhaust gases are immediately passed to atmosphere after exiting said SCR catalyst without further treatment of emissions contained therein (See col. 9, lines 7-67; col. 10, lines 1-26).

***Claims 1-6 and 16-20 are rejected under 35 U.S.C. 102 (e) as being anticipated by Peter-Hoblyn et al. (Peter-Hoblyn) (Patent Number 6,051,040).***

Regarding claim 1, Peter-Hoblyn discloses an exhaust aftertreatment system (Figs. 1-2) for use in a diesel engine (10) comprising:

a) a catalyzed soot filter (20) downstream of the diesel engine (10) and through which the exhaust gases from the diesel engine pass, said catalyzed soot filter (20) in direct fluid communication with the position at which said diesel engine discharges said exhaust gas without any intervening catalyst therebetween (See Figs. 1-2);

b) an SCR catalyst (30) downstream of and in direct fluid communication with the catalyzed soot filter and through which the exhaust gases from the diesel engine pass after passing through the catalyzed soot filter (See Figs. 1-2); and,

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c) a metering valve (e.g. 50, 52) for metering a reducing agent tending to reduce NO<sub>x</sub> at elevated temperature in the exhaust gases when passing through the SCR catalyst (e.g. See col. 5, lines 46-67; cols. 6-8, lines 1-67; col. 9, lines 1-18).

Regarding claim 2, Peter-Hoblyn further discloses that the reducing agent is ammonia and the metering valves meters the ammonia at a position between the catalyzed soot filter and the SCR catalyst (e.g. See col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 3, Peter-Hoblyn further discloses a mixing station (50) upstream of the metering valve for producing ammonia in gas or liquid form from an ammonia precursor such as urea (e.g. See col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 4, Peter-Hoblyn further discloses that the SCR catalyst is a lean NO<sub>x</sub> catalyst of a high or low temperature type and the reducing agent is a hydrocarbon (e.g. See col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 5, Peter-Hoblyn further discloses that the metering valve is positioned upstream of the catalyzed soot filter (e.g. See col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 6, Peter-Hoblyn further discloses that the catalyzed soot filter and lean NO<sub>x</sub> catalyst is formed as single brick, the brick having an upstream catalyzed portion acting as a soot filter and a downstream catalyzed portion acting as a lean NO<sub>x</sub> catalyst (e.g. See col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 16, Peter-Hoblyn discloses a method for reducing NO<sub>x</sub> emissions produced by vehicles powered by light duty diesel and similar engines having exhaust gas operating temperatures as low as about 200 EC comprising the steps of: a) increasing the NO<sub>2</sub>

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concentration present in the NO<sub>x</sub> gases initially generated by said engine by immediately passing the NO<sub>x</sub> exhaust gases thorough a catalyst soot filter and without passing said gases through any catalyzing device prior to entering said soot filter; b) metering an ammonia reductant into said exhaust gases after said exhaust gases have exited said catalyzed soot filter; and, c) directly passing said exhaust gases with said reductant through an SCR catalyst for reducing said NO<sub>x</sub> (e.g. See Figs. 1-2; col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 17, Peter-Hoblyn further discloses that the soot filter has a catalyzed surface containing at least 25 g/ft<sup>3</sup> of a platinum metal group (e.g. See Figs. 1-2; col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 18, Peter-Hoblyn further discloses that the SCR catalyst has a catalyst composition of zeolite, a promoter selected from the group consisting of iron and copper and a refractory binder (e.g. See Figs. 1-2; col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 19, Peter-Hoblyn further discloses that the nitrogen reductant is ammonia and said quantity of said reductant metered to said exhaust gases does not exceed a normalized stoichiometric ratio of 1.5 (e.g. See Figs. 1-2; col. 5, lines 46-67; col. 6, lines 1-67).

Regarding claim 20, Peter-Hoblyn further discloses that the exhaust gases are immediately passed to atmosphere after exiting said SCR catalyst without further treatment of emissions contained therein (e.g. See Figs. 1-2; col. 5, lines 46-67; col. 6, lines 1-67).



*Allowable Subject Matter*

Claims 7-15 are allowed.

Since allowable subject matter has been indicated, applicant is encouraged to submit formal drawings in response to this Office action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

*Prior Art*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure and consists of four patents:

Hirota et al. (Patent Number 6,233,927), Matros et. al. (Patent Number 6314722), Hirota et al. (Patent Number 5974791), and Hirota et al. (Patent Number 6199374) all disclose an exhaust gas purification for use with an internal combustion engine.


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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Binh Tran whose telephone number is (703) 305-0245. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reach on (703) 308-2623. The fax phone number for this group is (703) 746-4561.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0861.

A handwritten signature in black ink, appearing to read 'Binh Tran', with a stylized flourish extending upwards and to the right.

BT  
March 18, 2002

Binh Tran  
Patent Examiner  
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